Architectural CONCRETE

Concrete for Sears in Every Climate

By Leonard E. Dunlap*

WITH the occupation of the new Sears, Roebuck & Co. store at Houston, Texas, early this year, our architectural firm has completed a program of five large retail store buildings for this well-known company. In design and general character the Houston building is similar to those at Glendale, Calif., Highland Park, Mich., Baltimore and Chicago, and it is like them in construction—architectural concrete.

In a previous issue (see Architectural Concrete, Vol. 4, No. 2) Mr. George W. Carr of our firm described the incidents relative to undertaking this program in concrete. He said, among other things, that selection of this material was not only as an adventure in a rather new medium, the extensive development and wide acceptability of which merited its use, but a more important reason was to create beautiful, appropriate structures at a saving in both time and money for the client. He felt that since the material had definitely arrived, architects must include its use in their well-rounded experience.

Since completion of this large program in a material that is still regarded as more or less of a novelty in some regions, certain questions are asked that we may be able to answer in view of our experience: Do you think as well of concrete now as when the program was started? Can you build it anywhere? Were there any headaches? Would you do it again? The answer to all of these questions is "Yes!"

We know a lot more about concrete now than we did three years ago before work started at Glendale; but we don't know everything, for knowledge of any material improves only with use. What we have learned has come through study of the material, attention to details in design and to careful supervision on the job; but I believe that no greater efforts were needed or expended to produce desirable results in our concrete buildings than should be accorded to buildings of more traditional construction. The differences, where there were any, lay mainly in methods and techniques, for concrete has its own characteristics and they must be recognized and dealt with from the inception of plans to the finishing of the last surface.

We encountered problems due to geography, but not the big bad wolf that is supposed to scare you out of building a concrete structure anywhere you please. These problems were variations in the local materials needed for concrete—sand, gravel and stone—but these were adjusted in designing the mixes and no serious difficulties were encountered.

Despite the widely scattered locations of these buildings, which are commonly supposed to have a bearing on the results achieved in concrete work, our structures are as uniform in strength, workmanship and satisfaction to the client as it is possible to achieve in any material. This should answer the question of whether we would build again in concrete: we would do it anywhere that you can erect a foundation.

In discussing among ourselves the preliminaries of this program we were mindful of the possible difficulties that might arise from erecting buildings in such widely separated regions as California, Michigan, Maryland, Illinois and Texas. Here was almost the greatest range of climatic conditions that could be found in continental United States, and if there were any truth in the bugaboo stories about concrete in cold, damp climates or hot, dry climates, we would be in the middle in committing ourselves to such a program. Moreover it was almost a certainty that each of these projects would be erected by contractors without previous experience in architectural concrete.

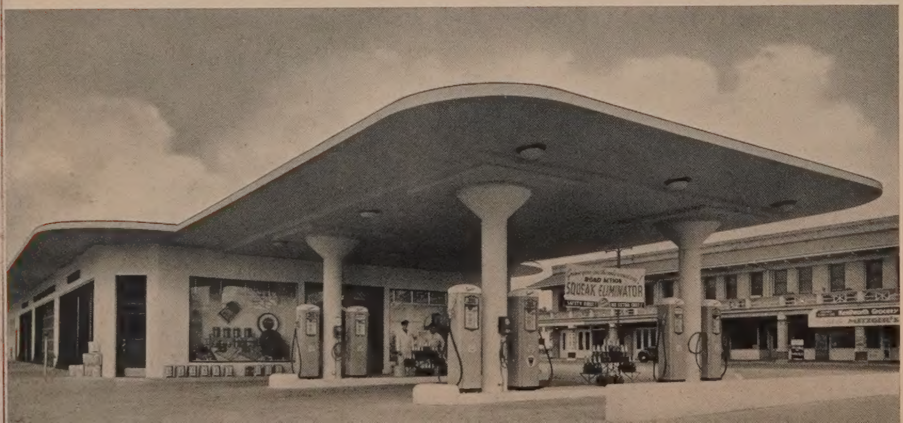
Investigation revealed no evidence that concrete buildings, carefully designed and properly constructed, were not

*Chief Engineer, Nimmons, Carr & Wright, architects.

A balcony over the entrances from the service and parking yard serves also as an outdoor display space in the Houston store. It is of reinforced concrete construction with a polished, Texas granite handrail matching the base course of the building.

General view of Houston store showing the sun canopy over the sidewalk and the ample and attractive display windows.

Across one side of the parking lot is the service station, a concrete building with flat slab canopies at each end.



as good in Alaska and Minnesota as they were in California and Florida. This threw the problem, without excuses or alibis, back into our laps for as architects and engineers we would be the dominating influence on these buildings from the beginning to the end. We not only controlled the designs but were responsible for the supervision. Structurally we knew our ground, for we had used the cruder forms of concrete for years in foundations and the structural frames of buildings of all kinds. Something we had to learn was the finesse of handling concrete in exposed surfaces, and we were careful that our familiarity with structural concrete should not breed indifference to the more precise problem of architectural concrete. The importance of studying and learning an improved technique had to be passed on to the contractors who, because they had thrown thousands of yards of concrete into forms for 20 years or more, might feel there was nothing more to know about it.

We recognized the extent of our responsibility, but the advantages that architectural

concrete construction would bring in architectural design, economy and time saved seemed to be worth the effort required. I would not care to make the dramatic claim that we took up the mighty challenge and fought it through with all our resources, but we did proceed with care to learn our job and to steer away from avoidable errors.

The first job completed at Glendale, Calif., was not altogether a fair test of our new problem. The building was located in the cradle of architectural concrete where the public takes this type of building for granted. The contractor was familiar with the procedure and labor was trained to the routine. For our part, however, in the preparation of the plans and specifications, the project was considered as no different from the jobs that followed in Michigan or Maryland and was given the same thought in every way.

Conditions were different on the next building erected near Detroit. The contractor had never done an architectural concrete job, and a large part of the work had to be done in winter, and not a mild winter. Some difficulties at the outset with variation in materials were ironed out satisfactorily by adjusting the mix. Measures were taken to protect the concrete placed during cold weather, and the results were completely satisfactory. There is little to choose between the building at Glendale, erected under California sun and the one built in snowy, cold Michigan in midwinter. Their appearance today is comparable.

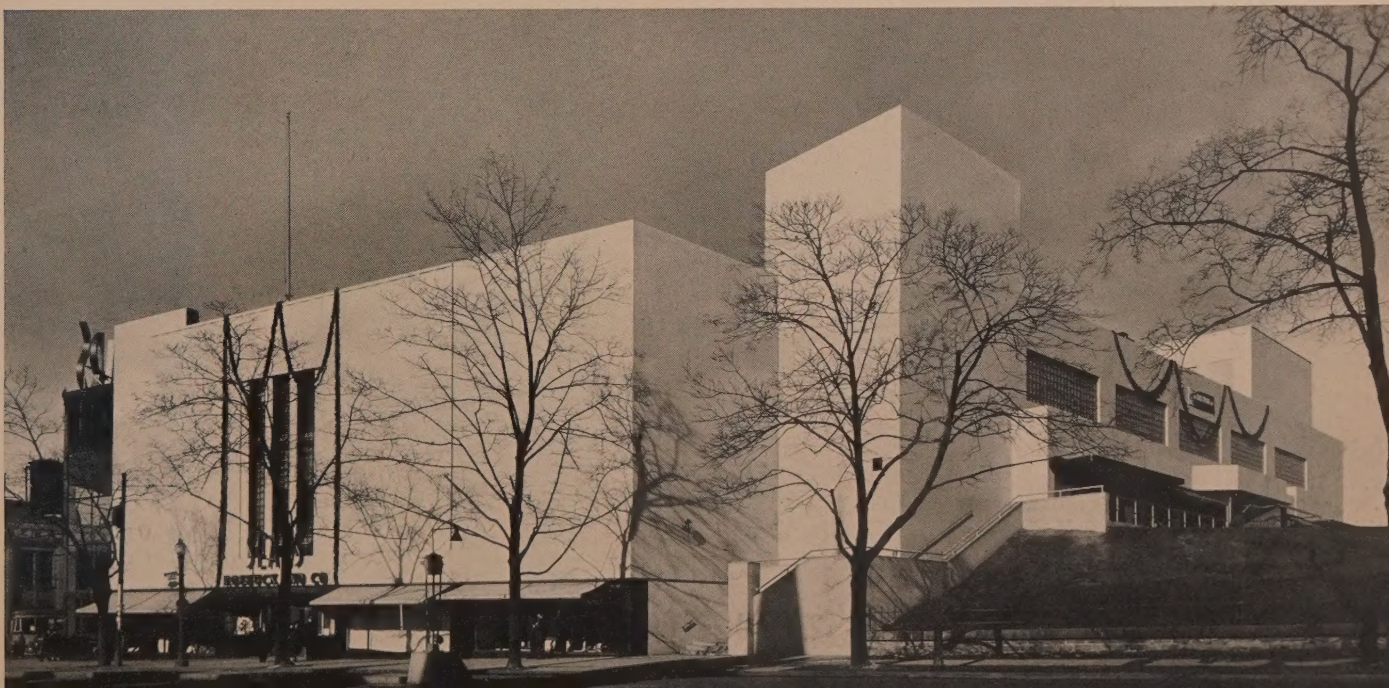
Out of these two experiences the importance of grading aggregates, controlling the concrete mixes and care in form construction was learned to the still further advantage of work on the next three buildings. It was determined by this time that internal vibration was not necessary for the walls of our buildings, but light external vibration of the forms accomplished with chipping hammers was beneficial. We had

A feature of all Sears stores is large, free parking areas. A typical arrangement is that at Highland Park, Mich.; Patterson Engineering Co., Detroit, was contractor.

learned the value of laying out the forming on the drawing board and had seen the results of carefully erected forms.

On the three succeeding structures none of the contractors had previous experience with architectural concrete. Each project was approached by first informing the contractors of our expectations and impressing them with those parts of our requirements which were rigid, inflexible and not to be overlooked for any reason. Complete understanding between our construction superintendents and the builders was the signal for work to proceed. At all times there was the closest cooperation between our superintendents and the contractors in overcoming obstacles that would pop up in carrying the jobs through to successful conclusion; and it was the superintendents' duty to observe all the work meticulously as it was done to determine whether it met our standards and was acceptable.

At Sears' Baltimore store the parking lot is at second-floor level. This building, like all the others, has smooth-formed walls. Consolidated Engineering Co. was the contractor.



At Chicago the corner is utilized as a huge two-story display window. Lundoff-Bicknell Co. was the contractor. An addition to this building is now under construction.

There is little to note about the work at Baltimore. A fine structure was produced there in satisfactory time. Construction of the building at Chicago was conducted with improvements in concreting practice, notably better grading of coarse aggregate, refinements in forming and improvement in treating the form surfaces. This project can speak for itself.

In the Houston store just completed the most difficult problem was in selection of fine aggregate. Our first choice of sand was found to contain bits of charcoal and clay balls that could not be screened out. This produced a dead concrete although a surprisingly workable mix. Our next sand contained an excellent gradation, but lacked in very fine materials. This was finally solved by adding limestone dust to the mix in carefully gaged quantities, which produced a workable mix and a concrete that would finish up to standards.

A demonstration of how concrete technique advanced during the three-year period in which these five buildings were erected, is the introduction of "control joints". It is recognized that all masonry material shrinks, thereby setting up stresses of considerable magnitude. By providing control joints which are made by tacking wood or metal strips to the forms, thus leaving narrow vertical grooves in the concrete on the inside and outside of the wall, these volume change stresses will be relieved and any tendency of the wall to crack is confined to the control joints at predetermined locations. Penetration of moisture through the joints is prevented with a non-staining, concrete-colored calking compound.

In 1937, at the time of the Glendale building, these joints were just being tried out on a school project up in Washington state. By the time of our Houston building the control joint was becoming a familiar phrase in concrete construction vocabulary. It had been tried out on a score or more new buildings with apparently such results as would warrant our use of it on buildings of the size of the Sears stores. We incorporated control joints into the Houston store design at locations where their performance will be watched with intense interest.

Considering all of these structures for purposes of comparison, there is not much difference between any of them in quality of results obtained. They all commanded the same attention and, except for local conditions, were erected in comparable periods of time. In all cases, however, we believe the buildings were erected and ready for use within much less time than structures of the same size built of other materials. Inasmuch as this time-saving economy was one of the reasons for the choice of concrete, our early expectations were justified.

These buildings were designed for execution in concrete and their proper construction in this material could result only in satisfaction to the architects.

First Sears store erected under the program was this building at Glendale, Calif. Ford J. Twaits Co. of Los Angeles was contractor.

Street-level view of Sears, Roebuck & Co. store at Los Angeles. Designed by the company's national construction department, John Raben and John Stokes Redden, architects, and Oliver G. Bowen, engineer. Ford J. Twaits Co., contractor.

Store for Sears in Los Angeles

By Oliver G. Bowen, Structural Engineer

A STROLLING window shopper sees only what appears to be an ordinary sized, two-story building set off by double deck show windows and a pleasing architectural concrete design when approaching the new Sears, Roebuck & Co. retail store at Pico and West Blvds. in Los Angeles. This modest illusion is due to the odd shape of the lot on which it is erected and to the unusual contour of the ground, for it is built into a hillside. Motorists approaching the building from one direction will end up on the roof deck which accommodates 275 cars. Other approaches lead to parking space for 455 more cars. It is only when coming into the building by any of six entrances to encounter seemingly endless aisles and merchandise displays, that a full conception of the size and extent of this structure is realized. It is a camouflaged mammoth including, in its unusual layout, a reinforced concrete bridge 125 ft. long.

It is quite natural that the jig-saw shape and peculiar contour of the site should present problems in architectural and engineering design that were, to say the least, unusual. As structural engineer I had ample opportunity to observe the skill with which the architecture was fitted to the site, turning apparent drawbacks into ultimate advantages in utility and economy.

Interesting problems, both in planning and engineering, started right from the ground. Not only was the site of irregular shape and contour, but the lower portion had once been a large pool in Ballona Creek. The bottom of this pool, once used as a dump, was about 10 ft. below basement floor level in some places and but 2 or 3 ft. in others. Before deciding on any specific method of handling the pool area and other soil conditions, nineteen 18-in. diameter holes, 30 ft. deep, were drilled and soil samples tested. On the

basis of these tests places which had been indiscriminately filled were excavated and re-filled with sand, flooded in place and rolled.

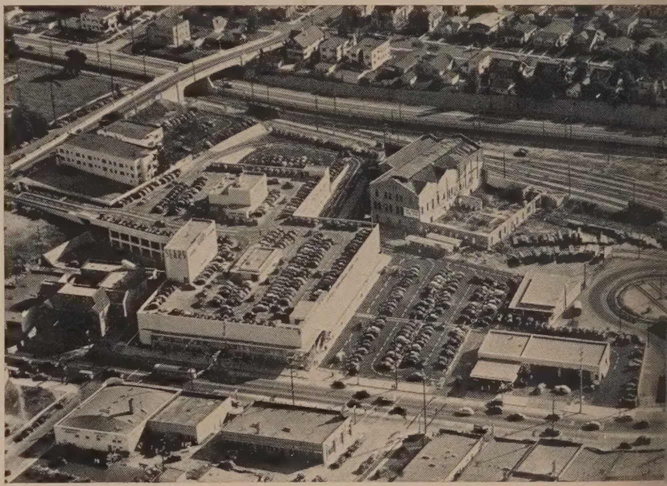
Four types of foundations were designed and estimated: concrete piles, wood piles, concrete caissons and concrete mat foundation. The latter proved most economical and feasible, and was adopted. This was designed as an inverted flat slab 18 in. thick, with the bearing surface 3 ft. 3 in. below the finished basement level. Fourteen inches of sand fill was placed on top of the mat, providing space for drainage and piping, and then the basement floor slab and terrazzo finish took up the remaining 7 in. The mat foundation extends under the entire area of the building although the two structural units, sales and storage superstructures, were treated differently.

Existing laws made it necessary to design against the possibility of an earthquake, and boundary conditions together with architectural treatment, made it seem advisable to design the sales portion as a rigid building with concrete walls taking the brunt of earthquake stresses, and the storage portion as a flexible building with the columns and floor system taking the seismic lateral forces. Flat slab construction was used for all supported floors and roof.

Undoubtedly the most complex problem from the engineering standpoint was fitting the storage building into the hill. Actually this was several interrelated problems. The storage section was built into the hill on the north of the lot where a driveway and parking space was planned at the roof level. This condition necessitated either a three-story retaining wall, 47 ft. high, extending the building in steps up the hill, or building an approach deck supported by beams and columns.

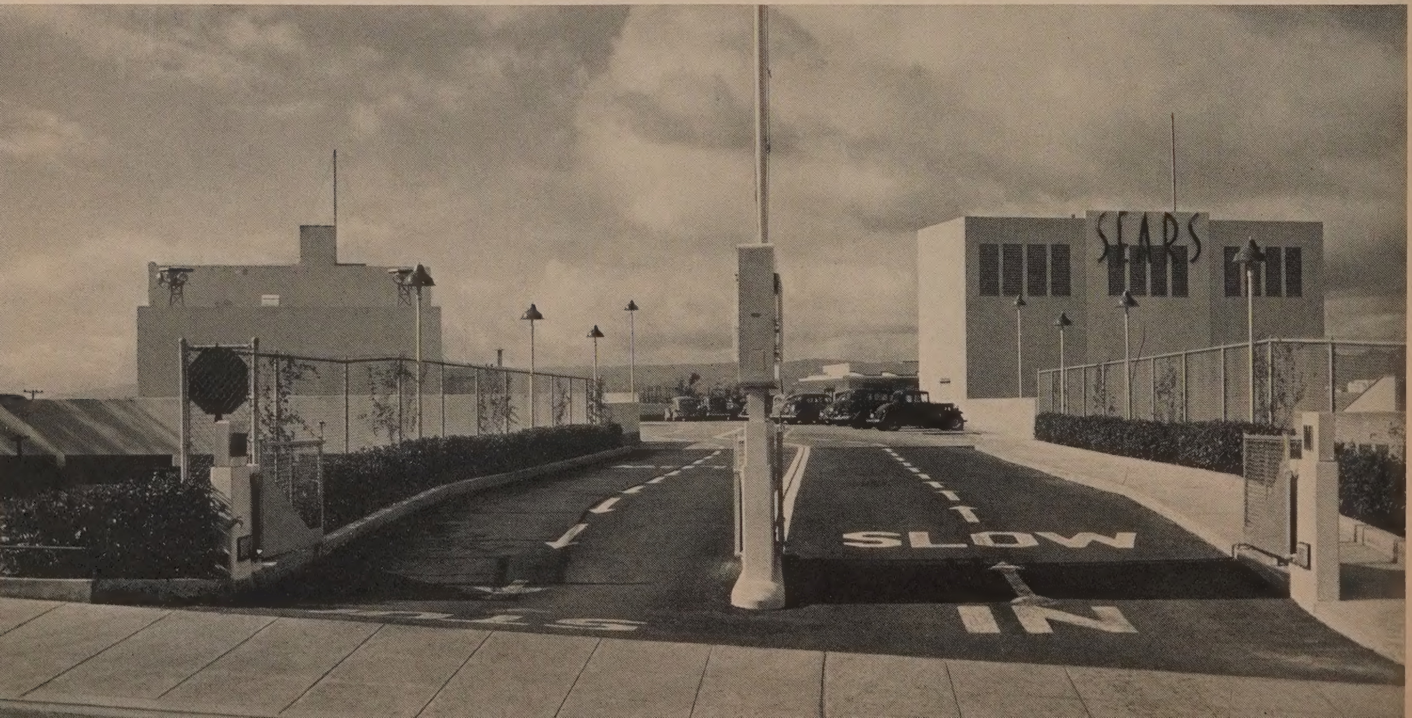
The stepped-up building idea was discarded and three different designs of retaining walls were prepared and priced, and these prices compared with the cost of a concrete approach deck. A retaining wall supporting the earth against the building was more expensive than the approach deck, and also had the drawback that, in case of a severe earthquake, great pressures exerted against the wall might cause it or the building to fail. A deck would leave the building free to vibrate in any direction and this method was adopted for its combined economy and safety.

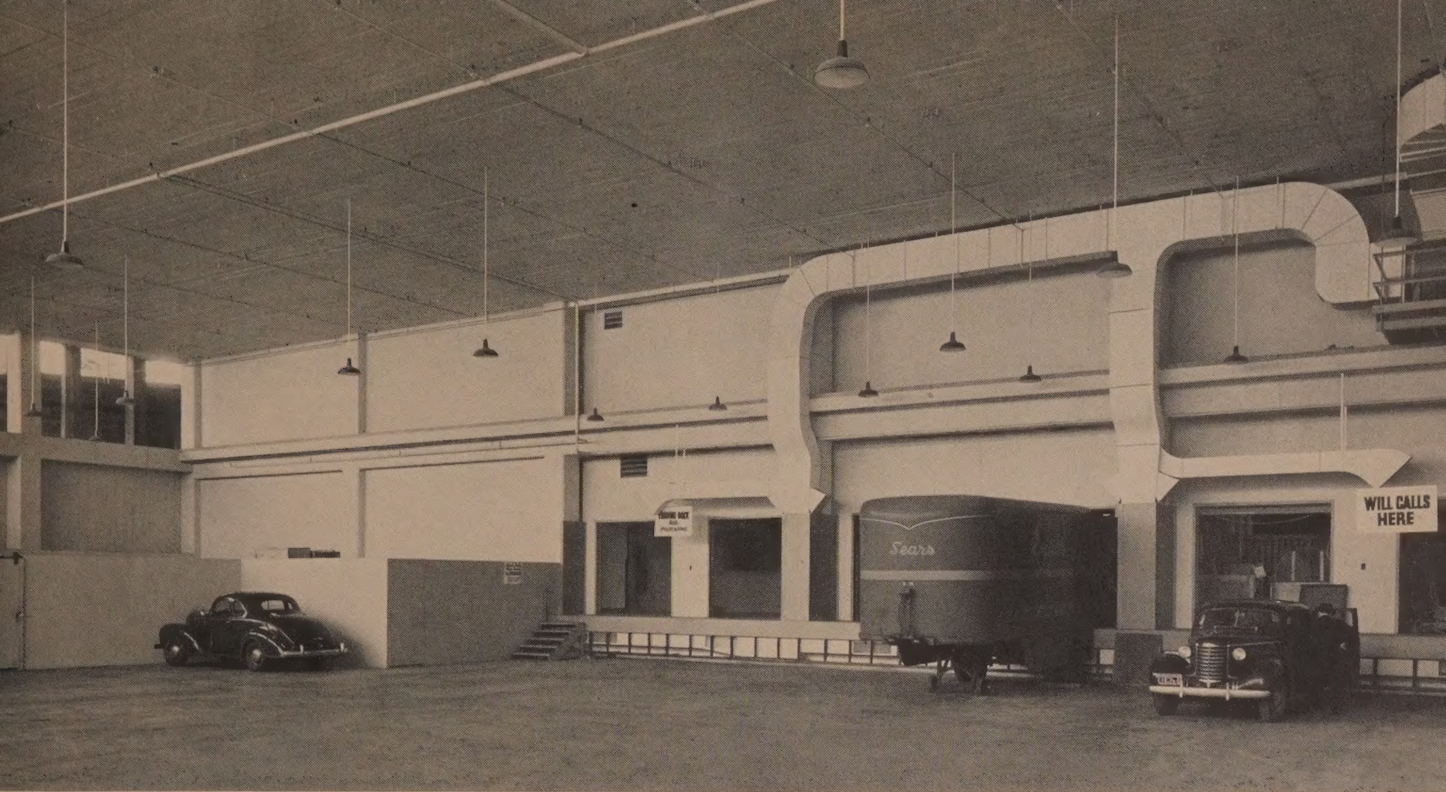
A major problem remaining was how to get cars from the West Blvd. entrance over the truck court to the roof of the sales building. This gap was 125 ft. long and from 64 to 83 ft. wide. Trucks at approximately first-floor level must



Aerial photo shows unusual contours of site. Parking space on ground and roof accommodates 730 cars.

Ramp over hollow concrete slab gives access from street to spacious parking area on the roofs of the sales and storage buildings.





Shipping and receiving platform and truck-turning space are located under hollow slab span. Future second floor will be suspended from this slab by hangers from connections tapped into steel inserts in the ceiling slab.

operate and turn in this area, and customers' cars, coming in from West Blvd., must pass over the truck space onto the roof of the sales building. In addition, provisions for a future second floor covering this entire area were to be made.

All kinds of solutions to this problem were proposed and studied. A hollow reinforced concrete slab construction, spanning the short direction, was finally adopted as the cost was satisfactory and the future second floor could be hung from the soffit. Total depth of hollow slab was 5 ft. 1 in., the top slab 5 in. thick, the bottom or ceiling slab 4 in. thick. The ribs were 6 in. wide, spaced 4 ft. 10 in. on centers, with 6-in. radius fillets top and bottom. Removable steel forms were used in the cellular spaces and concrete placing was continuous from top to bottom. There was less than ¼-in. deflection 24 hours after forms were stripped.

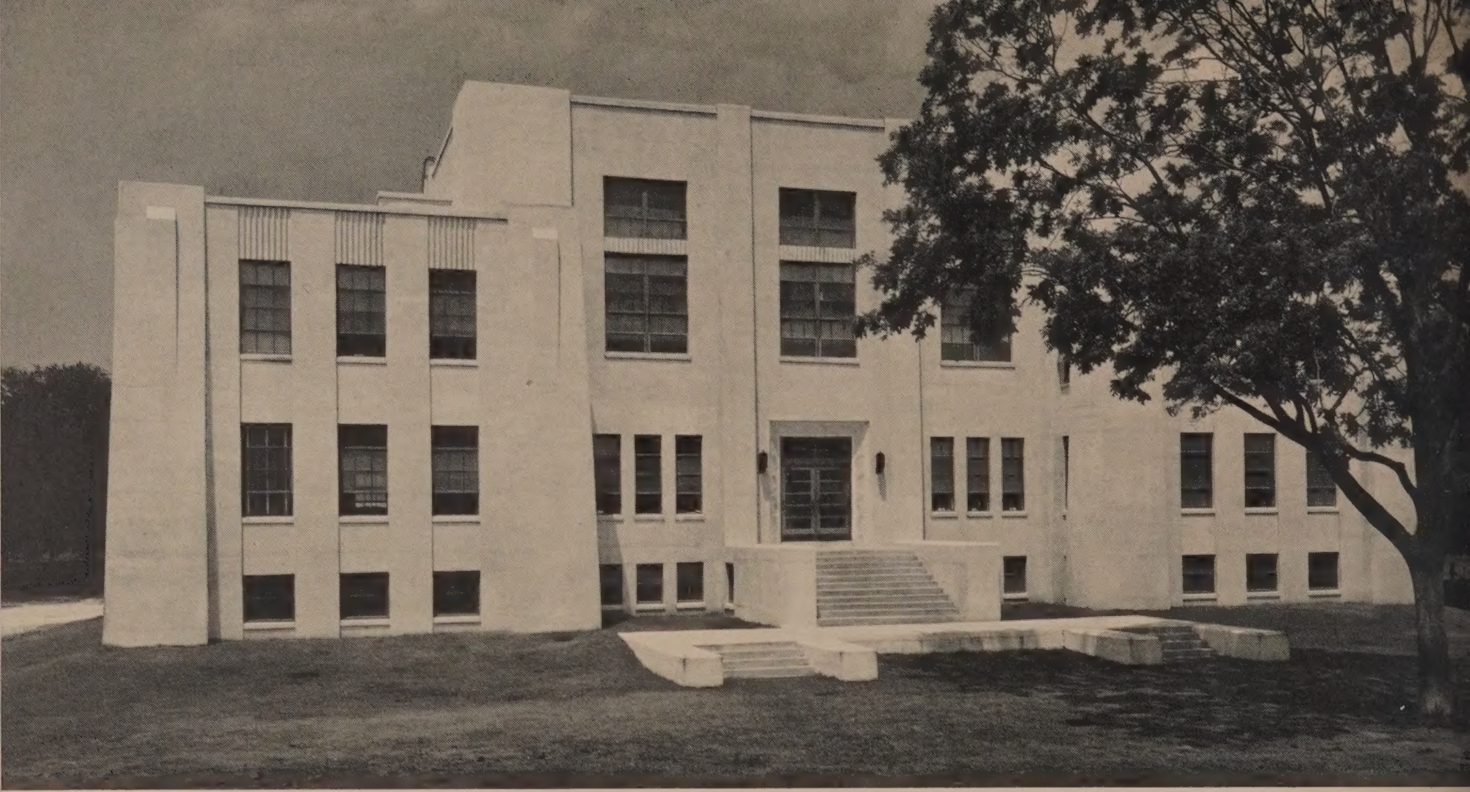
This construction left a smooth, flat ceiling, since connections for future hangers were tapped into structural steel inserts, the bottom surfaces of which were flush with the ceiling. In summing up the importance of this hollow "slab without visible means of support", it should be remembered that it is not only wholly self-sufficient, but acts as a strong safety factor for the entire building.

Except for a small, one-story steel frame structure, the entire layout is in architectural concrete, including a service station at ground level. The sales and storage buildings are of modern design with simple lines and smooth surfaces broken with vertical markings to relieve the rather dominant horizontal emphasis of the walls. Forms for exposed surfaces, generally, were of plywood with some corrugated iron used for special effects. Resulting textures were most excellent with practically no pockets or blemishes to be patched.

Placing of concrete was begun by Ford J. Twaits Co., general contractor, on April 7, 1939 and was finished by August 15. All work was completed on October 16. Truck mixers of 4-cu.yd. capacity were employed to mix and transport concrete from batching plant to the work. The batching plant, located on the site, comprised overhead steel bins arranged to supply three gradings of aggregates which were weighed into mixing drums. Water was measured through a meter and portland cement put into the mixers by the sack. Water control was obtained by regulation of the slump which was maintained at 5 to 5½ in.

Total cost of the project was slightly less than $1,500,000, including the sales and storage buildings with a total floor area of 235,000 sq.ft. in basement, first and second floors, and the implement building and service station. Equipment includes an escalator system which provides movement from floor to floor and to the parking space on the roof.

The architectural design and drawings were prepared by Sears' national construction department under the managership of L. B. deWitt. Architects John Raben and John Stokes Redden were respectively responsible for the conception of the design and preparation of the architectural drawings, and Chapin Roberts for the mechanical and electrical work.



A storm refuge as well as a home for justice is this new architectural concrete courthouse for Cameron Parish, La. Located at Cameron, on the Gulf of Mexico, it was designed by Herman J. Duncan, architect, and built by A. Farnell Blair.

Cameron Parish Courthouse

By Herman J. Duncan, Architect

FOR many years Cameron Parish, La., was almost a legendary place on a huge but little-known stretch of Gulf of Mexico shoreland. Many knew of it, but few had seen it, for it was far easier and more comfortable to stay away than to try to get there. It was known to hunters of geese and duck and to game fishermen who agreed that it was the most secluded sportsman's paradise in the South. Many acres of isolated salt marshes had been reserved years ago as a bird sanctuary.

Cameron, the little town on the sandy, flat beach beside the Calcasieu River, is probably the only county seat in America that is still unconnected with the rest of the state by a railroad or a continuous highway. The main road, which is connected by two long ferry rides on the trip between Cameron and Lake Charles, is as recent as 1931 when it was built as a county thoroughfare. Before that time Cameron was accessible only by the old sternwheel steamer, "Borea Alis Rex", which plied into the Calcasieu three times a week from Texas towns.

Suddenly, early in the 30's, Cameron Parish was jolted out of its sunny lethargy by two notable events. One was the discovery of oil at Hackberry, halfway up the county, and in the Gulf almost at the front door of Cameron. The other was the discovery that millions of delectable shrimp had chosen the waters off Cameron as their home. Almost overnight the few little fishing boats multiplied to hundreds, and oilmen came and with them trucks, machinery and—always a by-product of new commercial activity—complex problems of law. A new courthouse and a proper jail were absolutely necessary, everyone agreed, and there was an opportunity to get one in 1937 through Public Works Administration aid.

How the building came to be what it is in design and construction was a procedure as logical and forthright as counting from one to ten. In the first place, a building of this importance should be firesafe, particularly since there is no fire protection in the town. Its site faces the sea and is subjected on occasion to winds of hurricane fury and to tidal waves of great destructive possibilities since the land lies low and rises very gradually from the beach. A definite consideration in designing the building should be its possible use as a storm refuge. This meant a building of durable, strong construction.

There were no local manufacturers of building materials,

so all manufactured materials had to be shipped in by truck and ferry. Sand and gravel were available, so concrete construction would require a minimum of shipped-in materials, all of which were potent arguments for its use. It was also notably advantageous for fire and hurricane protection. Since this construction fitted the needs of the parish and promised economies from the very beginning of the work, it was selected without question.

No building could be more completely concrete than this one. Its wide foundation walls and wider footings go down through sand and shell to hard clay. Above grade the walls are 12 in. thick, buttressed by battered pylons and braced by concrete floors and roof. The battered pylons, aside from adding strength to the walls, give an architectural appearance of mass and strength that are most assuring in a community that has no other permanent building of any kind.

The architecture followed the structural design and was meant to suggest as simply as possible the development of the building upon its floor plan. Aside from the fluted spandrels above second-story windows the only decorative detail is a molded band about the main entrance. If the building appears strong, durable and clean of line and mass, the architectural design was quite successful.

To the rear of the main structure, which houses the courtroom, county offices and some state functional offices, is the jail. It is a modern, sanitary structure connected with the main building by a heavy steel door, and is locally held in awe as an escape-proof jail if there ever was one. It contains bunk rooms, bath and toilets for men and women, colored and white, and a hospital cell. The best of jail equipment was used throughout.

The 12-in. walls are buttressed with battered pylons for greater strength against storm as well as for architectural effect.

To the rear of the courthouse is the jail, a two-story structure equipped with most modern, steel prison fixtures.

Exterior walls of both courthouse and jail were formed against plywood and finished by rubbing. The interior walls and partitions of the courthouse are mostly finished with plaster while the concrete is left exposed in the jail. Most of the floors are exposed concrete throughout, although some day other finish materials may be applied.

The contractor, A. Farnell Blair, of Lake Charles, La., achieved an excellent job of concrete despite the obstacles presented by the location and the difficulties of transportation. The building is quite up to the expectations of the architect and it is regarded by the 350 permanent residents of Cameron and the 6,000 or more widely scattered citizens of the parish as a kind of monumental wonder, which it is in comparison with anything for miles around.

The courthouse was completed and occupied early in 1938 at a total cost of about $125,000. Cubic foot cost of the building was slightly less than 31 cents which, considering the location of the structure and the problems involved, must be considered very low.

The court of Cedar County, Mo., celebrated its 95th year by moving into a new concrete courthouse at Stockton. An architectural concrete building of modern lines and sharply formed detail, it was designed by Marshall & Brown, architects and engineers, and built by W. F. Edgell & Son, contractors.

Cedar County Courthouse—Missouri

BY JAMES D. MARSHALL*

JUST 95 years after it was established, the court of Cedar County, Mo., moved into a new concrete building, its fourth seat of justice and third building in all these years. From 1845 to 1855, when Missouri was a rough but ready outpost country, court was held in the home of Elisha Hunter, two miles south of Stockton, the present county seat. Then, with $5,500, a frame courthouse was built in Stockton city square and the law held forth there until, during a raid by "Shelby's men" in 1863, it was burned to the ground. A second structure was completed in 1867 and occupied until the new building was ready early this year. The new courthouse has the distinction of being the first architectural concrete courthouse in the state of Missouri.

One of the prime considerations in planning the new courthouse was firesafety, for the old county records have been endangered for many years. Since Stockton is not situated on a railroad, transportation costs of building materials was an important consideration. Because sand could be secured from the nearby Sac River and crushed rock could be obtained from excellent quarries at Phenix, Mo., all factors pointed toward concrete as the ideal building material for the job.

As to appearance and performance of concrete, the members of the county court satisfied themselves by visits to concrete structures in adjacent states. A new site was then

*Marshall & Brown, architects and engineers.

chosen for the building and plans were prepared. Adoption of a new site permitted the use of the old building during construction. It has since been demolished.

A two-story building with full basement and a third-floor portion over the rear for jail and sheriff's quarters was the accepted design. Because of the grade, there is excellent daylight in all basement offices. The usual county office requirements were provided together with necessary vaults, reception rooms, courtroom and a large circuit courtroom.

Exterior decorative detail is confined to the fronts of the two buttresses and to the spandrels between first and second-story windows. Embellishment in these areas was applied directly to the structural concrete by means of plaster waste molds. The details on the buttresses symbolize law and justice while the spandrel motifs are conventionalized designs based on the community, government and law: the cedar tree as the emblem of the county, the star of statehood, the fasces of law and order, and the tablet symbolizing the fundamental laws of the Decalogue. The incised letters over the entrance were formed against plaster molds secured to the plywood forms.

All outside corners had $\frac{1}{4}$-in. bevel strips placed in the plywood forms to facilitate stripping. White pine was used for the mold work adjacent to the window jambs and for the fluting on the front wall. A symmetrical pattern was made with 3x8-ft. plywood panels so that the faint lines which show on the completed structure harmonize with the symmetry of the building. Drawings were made in advance of form construction to locate the plywood joints, as well as the studs, wales and ties.

The exterior walls were furred on the inside with metal lath and finished with plaster. Partitions are tile with plaster finish and all inside wall surfaces are painted. Vestibule and corridor floors and stairways are terrazzo, while asphalt tile over concrete slabs was used in the offices and courtrooms and linoleum in the sheriff's quarters. Marble wainscot and base extend through all vestibules, lobbies and corridors.

Steam pipes are run in a reinforced concrete access tunnel completely surrounding the building below the basement floor.

The structural and architectural features of the building were developed simultaneously. Exterior walls are 14, 12 and 8 in. thick with continuous bands of reinforcement in

The third-story portion over the rear of the building provides space for the jail and permanent living quarters for the sheriff.

One of the two courtrooms —spacious halls with ample light and ventilation.

both directions and diagonal bars below and above all window openings. The floor system consists of concrete joists and girders, with haunched girders of 34-ft. span over the main courtroom. Construction joints were located to conform with the architectural design and with the capacity of the concrete equipment used. At the second floor this necessitated placing a section of wall above and below the floor at the same time the floor slab was placed. This made it necessary to use special care to align the wall forms vertically, which was done by tying them with heavy wire downward through the floor construction.

Three-quarter-inch Douglas fir plywood was used throughout for exterior forms with 2x4 studs and doubled 2x4 wales tied through with removable form ties which served also as spreaders. Inside surfaces of forms were sprayed with lacquer, which seems to minimize the number of air bubble holes on the concrete surfaces as compared with oiled forms.

A ½-yd. mixer with a full complement of auxiliary equipment was used on the job. Concrete was puddled and vibrated and the forms hammered with rubber mallets on the outside. Tie holes were filled and the surfaces rubbed down lightly with a portland cement grout and carborundum stone. Two coats of portland cement paint were applied to the exterior, the tone of paint being a very light grey.

Most of the concreting was done during winter months, hence it was necessary to provide means for heating the water and aggregates and protecting the concrete in the forms. Lengths of pipe were coupled together to form coils in the aggregate piles, and a loop around the building was made with lengths of 2-in. pipe, all of which was connected to a steam engine. Tarpaulins were placed over the top of forms to hold in the heat, and additional protection was given by piling straw against the walls and on the floors. These methods of protection were successful and quite simple.

The front steps were cast in one continuous operation, a job that required care and skill since it was a large area.

Cost of the entire project including courtroom equipment, blinds, landscaping, concrete walks and platforms and architects' fees was $112,960, or a cu.ft. rate of slightly more than 50 cents. This cost substantiated preliminary estimates.

Marshall & Brown, Kansas City, Mo., were the architects and engineers with W. L. Cassell, mechanical consultant. W. F. Edgell & Son, of Leavenworth, Kan., were general contractors with W. E. Fogerson, their superintendent on the project, and R. M. Sheeks, resident inspector. Hare & Hare were the landscape architects.

In Last Issue

We misspelled a name or two in spite of all the checking we could do. Hokason should have been HOKANSON & Bloom, builders of Belvidere, Ill., auditorium; and the builders of the Phoenixville, Pa., sewage plant were Albright & FRIEL instead of Frick.

The contractors on the Denver, Pa., waterplant—Rice & Weidman—were unintentionally omitted.

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PORTLAND CEMENT ASSOCIATION
33 West Grand Avenue, Chicago

Matching its splendid water supply in quality and size is the new
exemplify the modern spirit of the design. Planned to meet requiremen
Alvord, Burdick & Howson were consulting engineers. Black & B

Lansing Build

By Otto

CITIZENS of Lansing, capital city of Michigan, are proud of their distinctive architectural concrete water conditioning plant; and they are equally proud of their water supply which flows from deep wells capable of supplying 20 million gal. daily. Few cities anywhere, of the size of Lansing and even larger, are fortunate enough to have such a water supply source.

The modern, streamlined plant, designed for a maximum daily pumpage of 30 million gal. daily, conditions the water by the lime-soda ash process. This provides a water slightly softer than Great Lakes water, but harder than pure rain water. It assures a water that cannot be distinguished by taste from the natural supply. The undesirable features of hardness, scale-forming chemicals, corrosiveness and iron content, that are present in the well water before treatment have been eliminated.

Streamlining is the keynote of the architectural design

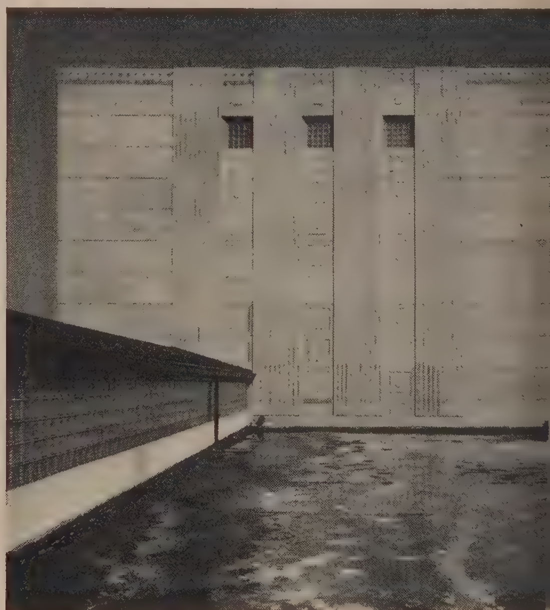
*General Manager, Board of Water Supply and Electric Light Commissioners.

The 32-ft. sculptured figure on the entrance tower was cast in a plaster waste mold made in sections by the WPA art project. It symbolizes a plentiful water supply.

for future requirements as well as the present.

The plant is designed for gravity operation so the water flows through the conditioning building to adjacent existing reservoirs without pumping. Water enters the plant 38 ft. above the footings and, with so much depth available above suitable foundation soil, it was decided to locate the sedimentation basins and secondary settling basins under the flocculators and filters respectively. Consequently the 877,000-cu.ft. volume of the structure covers but 27,000 sq.ft. of ground area, the over-all dimensions of which are 240x140 ft. Height from bottom of footings to grade is 22 ft., and from grade to top of headhouse, 82 ft.

The entire structure up to 1 ft. above normal waterline is designed as a unit according to principles of continuity. Above this point expansion joints divide the building into three parts: the filter section on the left, the headhouse at



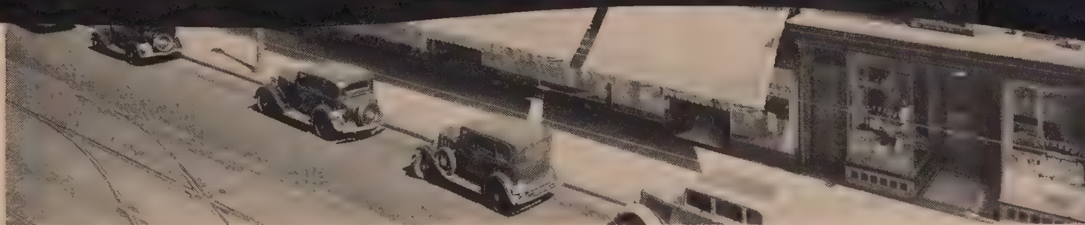
Walls of the headhouse were given verticality by four fluted pilasters unbroken from adjoining roof line to parapet.

the center, and the chemical storage basins on the right. Each of these portions of the building was designed as a continuous concrete frame.

Live and dead load of 62,000 tons is spread over the entire area on a mat footing, and even when eccentrically loaded the pressures are distributed nearly uniformly over the foundation. Exterior walls are designed to withstand a total pressure of 2,200 p.s.f. due to a 35-ft. hydraulic head.

Of particular interest is the two-way solid slab floor

be razed in units to make room for new structures as they are needed.



column caps generally used in this construction, caused us to adopt a smooth ceiling system of flat slab construction. This system involves the use of small structural channel cross heads and, aside from providing smooth ceilings, has the additional advantage of leaving column heads in place along the side of the building ready for new construction to be added. Short projecting ends of reinforcing bars were left for welding to new slab bars for future extension.

Because of the necessity for leaving the wall of the adjoining building in place until the new unit was complete, welded brackets were built into the new wall columns. These supported new steel beams placed on the inside of the old building to support its wood joist floor construction.

On completion of the new building, the old bearing wall between the buildings was removed, avoiding the need for shoring up the old work at any time during construction. Where combined footings supporting wall columns for the new building came lower than the wall footings of the old building, the old walls were underpinned down to the bottom level of these footings, none of which encroaches on the wall line of the old building.

To obtain the lines desired by the architect the front corner involves rather intricate cantilever slab construction. Each of the exterior wall columns has a small show window at street level, adding to display space and breaking up the monotony of the wide pilaster areas.

All concrete work throughout the building is of finished character, bearing the texture of the plywood forms used for all except the circular columns which were cast in steel forms. Except for two or three small, rough spots which were rubbed out, the concrete was left as it came from the forms and was finished inside and outside with portland cement paint.

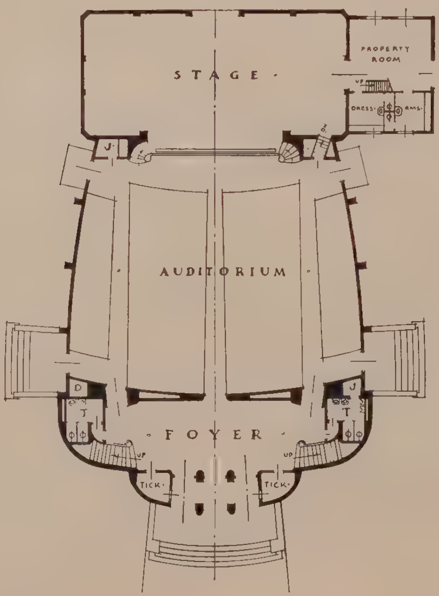
Crisp & Edmunds, Baltimore architects, feel that their first venture in architectural concrete construction has been most satisfactory. Construction was by Consolidated Engineering Co. of Baltimore. The writer was consulting engineer in charge of structural design for the architects.

Sweeping curves and sculptured detail take full advantage of the plasticity of concrete in the construction of this auditorium for Union High School, King City, Calif. Robert Stanton was the architect, Mac D. Perkins, the structural engineer, and A. Nelson, Inc., the contractor.

A Molded Design in Concrete

BY ROBERT STANTON, A.I.A.

ARCHITECTURAL concrete is seldom designed so completely and intentionally to express the molded character of the material as it is in an auditorium recently completed for the Union High School at King City, Calif. There is scarcely a line or mass that could be produced in other than a plastic material without sacrificing something of the flowing continuity effected in this building. For the most part the walls



are segments of curves of various radii moving into each other smoothly or as intersecting curved surfaces. Even the vertical accent of the walls is produced by the molded texture of the forms and by columns, pilasters and rustications formed integrally with the walls. And relieving the plain surfaces are plaques and panels and sculptured figures that were molded with the wall concrete.

The style of the building is modern but with a classic trend, a style chosen not only to produce the desired aesthetic appearance but for reasons of economy. To me this was the best ad-

aptation of any style that could be made to meet the requirements of size and shape of an auditorium. Main architectural interest is, of course, the masses produced by the curved walls; but these might have been cold and static without the texture, and certainly less interesting without the sculptured details which symbolize the history of the theater.

The three panels of sculpture arranged over the main entrance, the masks of Tragedy and Comedy that terminate the main entrance columns and the sculptured terminals of the side wall pilasters, were the work of Jo Mora, noted California artist who has done considerable work with concrete as a medium. These were produced by inserting plaster waste molds in the forms. This work, from both the standpoint of creative art and concrete execution, is outstanding.

The vertical texture of the walls was made by means of 1x6 surfaced boards arranged vertically in the forms. Although the forms were drawn tight enough to prevent fins between the form boards, the marks of the boards are pronounced enough to give the desired vertical feeling.

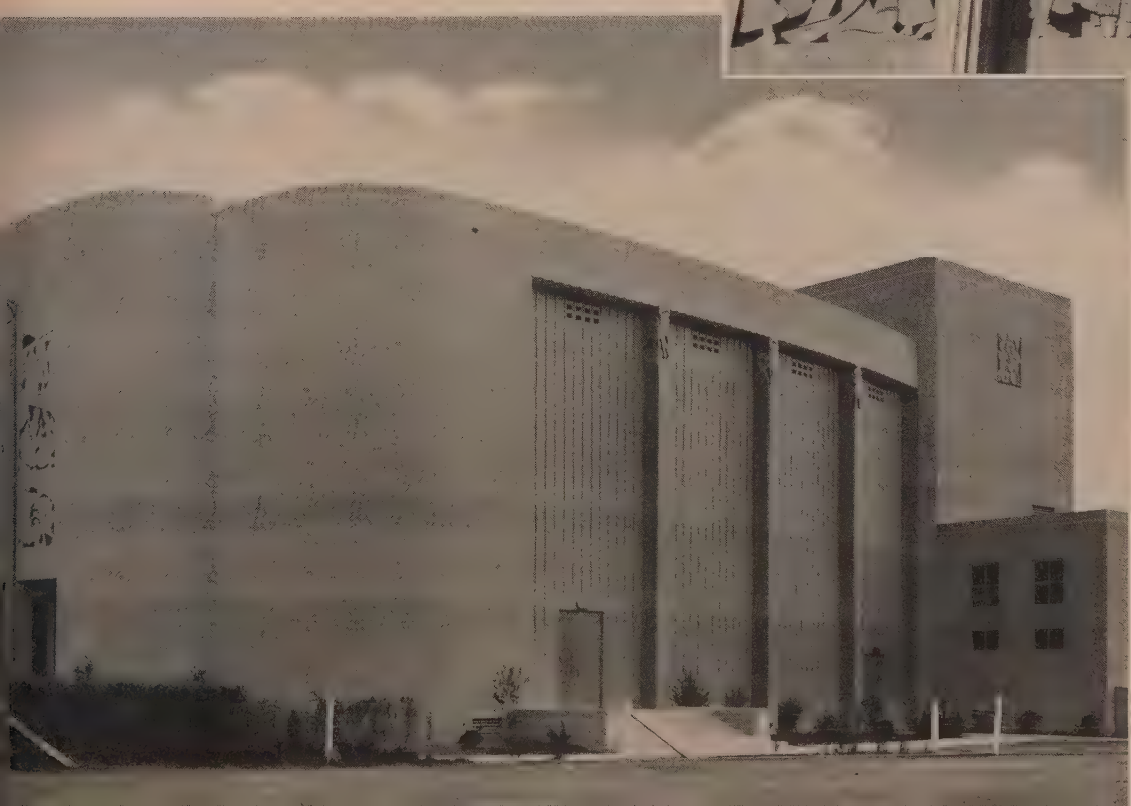
A rather unusual finishing method was used because of the preference for concrete without paint or wash coat treatment. After the forms were stripped the surfaces were cleaned and then sand-blasted to a light, even texture. To emphasize the relief portion of the sculpture, the recesses were finished with red pigmented portland cement wash. The results obtained in this building are most exciting and pleasing to me and justify my belief that concrete is a great medium for modern architecture.

The auditorium, which serves primarily the various assembly, dramatic and ceremonial functions of the high school, is also available for public use, and being one of the largest auditoriums in Monterey County, it will be kept busy housing the civic activities of several cities and towns in the district. The 1,000 seats in the hall face an exposed concrete proscenium arch and sculptured figures of Pegasus against red backgrounds.

Over-all dimensions of the building are 80x126 ft. The ceiling in the auditorium is 44 ft. high and that of the stage loft 57 ft. The building was erected over a period of 14 months at a total cost of $152,000, including all seating, stage equipment and a very fine public address system.

Mac D. Perkins was the structural engineer, G. M. Simonson was the electrical and mechanical engineer, and A. Nelson, Inc., was the contractor.

Sculptures over the entrance and elsewhere are the work of Jo Mora, noted California artist who frequently uses concrete for fine molded designs.



Added height was given to the structure by the vertical texture imparted to the walls by form boards and by use of tall columns and rustications.

Garage for Sedgwick County, Kansas

By O. C. Carlson*

WHERE county maintenance and storage yards are concerned we county engineers are generally poor housekeepers. Whereas we require orderly surroundings in our offices, our materials and storage facilities are allowed to resemble the worst sort of junk yards. Realizing this, Sedgwick County, in the fall of 1938, decided to clean house. We planned to completely rearrange our yard and build such facilities as were needed for the orderly and economical operation of our construction and maintenance terminal—the county yards.

From the beginning we were aware that we could rebuild and erect new facilities only as funds became available for these purposes. Our planning, however, revealed that the most urgent need was for an adequate equipment and material storage building.

We felt that several important requirements should be met in the design, namely: the building should be economical in first cost and maintenance; it should be firesafe; it should house approximately 70 pieces of motorized equipment and provide rapid and orderly entrance and exit.

The design finally selected—architectural concrete with an all-concrete roof—was believed to meet all of these requirements.

Over-all dimensions of the building are 120x145 ft., providing approximately 17,000 sq.ft. of floor space. Maximum height is 19 ft. above ground line. All of this space is available for storage except one room in the front portion which is used as an office and soils testing laboratory.

Exterior concrete walls are 10 in. thick, reinforced in both faces. To provide maximum space for equipment and open lanes to permit removal of any single unit of equipment when needed, a minimum of interior columns was necessary. A structural layout was, therefore, adopted requiring but one line of columns down the center of the building.

Roof framing consists of a 4-in. reinforced concrete slab supported on reinforced concrete girders of 60-ft. span, spaced 15 ft. 3 in. on centers. The girders are 1 ft. 10 in.

*County Engineer, Sedgwick County, Kan.

By arranging columns in one line down the center of the building, maximum space was provided for easy movement of trucks and equipment in the new Sedgwick County highway building.

wear well over the years. Their interpretation of these requirements was a modern structure. To me, as the architect, this meant concrete—and in order that the building might reflect the atmosphere of the village, a low, simple, friendly, as well as a "bankish" structure was designed.

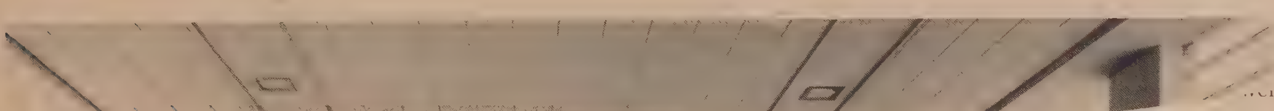
Except for the truss roof, it is entirely concrete, 50x95 ft. in plan, 24 ft. high, and includes an over-all basement and 12-ft. mezzanine floor at each end.

The lobby, or public space, is separated from the work space by a natural-colored, walnut screen carried to the counter line. Above is glass, bleached wood and light bronze. Since this screen is very low and of light color, it is visually almost not there. In most banks there is a barrier at the entrance and counter screens between the customers and bank personnel. As designed, this barrier is eliminated in the Bank of Carmel by making the main entrance vestibule a continuation of the U-shaped bank counter, thus forming the lobby. This, paradoxically, brings the pedestrian within the bank while he is still on the sidewalk.

Because of Carmel's historical background in relation to the Missions, it is fitting that the front ornament, cast in place, should reflect the historic heritage in a panel to the left of the entrance. And, not to overlook the promise of present and future, the panel at the right symbolizes youth and man of today and tomorrow. This ornament was not conventionalized as is so often the case, and was made to appear as intaglio carving of the concrete wall. The work was done with plaster waste molds. An attempt was made to hide the joint between the waste mold and the rest of the wall by filling with mastic. However, the joint is slightly evident in the finished wall which was given two coats of portland cement paint.

Plywood was used for contact surfaces of forms. The plywood was cut into squares to form a module for the design. This can be seen faintly in the finished wall.

The building was erected during a period of five months by Wm. P. Sweeney, contractor of Pacific Grove, Calif. Cost of the structure was approximately $40,000.



... walls are concealed in fluting and are sealed by 16-oz. copper strips and filled with premolded, limited extrusion joint filler. The expansion joints occur at the centerline of the roof slabs between the girders. Where these joints occur, the slabs are cantilevered from the girders.

The 5-in. concrete floor slab is reinforced with mesh, and expansion joints are provided at about 40-ft. centers, both ways. A number of floor drains were provided to permit frequent cleaning which is necessary because of the large amount of debris tracked in during inclement weather. Wall hydrants are installed along the walls to provide convenient outlets for hose connections. Compressed air outlets throughout the building provide for inflation of tires.

Six overhead gas heaters are calculated to give a minimum temperature of 55 deg. with an outside temperature of —10 deg.

In designing the building, an effort was made to keep the construction as simple as possible and to allow convenient places to stop concrete placement. In general, wall concrete was placed from the ground line to a horizontal rustication strip 12 ft. above, that being the height of either the sill or

... supported by studs and wales for good alignment. Quite a satisfactory mix suitable for placing with vibrators was produced, in spite of a deficiency of fines in the sand; however, in the future we will insist on a well graded sand with about 5 per cent passing the No. 100 sieve. Even though the mix lacked an ideal amount of fines, due to care in placing there was not a square foot of honeycomb in any of the concrete. The 3,000-lb. strength specified was attained, generally, in 7 days. Exterior walls were cleaned down with water and fiber brushes and painted with two coats of light grey portland cement paint.

The building was erected as a joint project of Sedgwick County and the Work Projects Administration. The cost, originally estimated in the neighborhood of $56,000, was reduced in the completed job to $48,150 or 16 cents per cu.ft.

C. L. Alberding is the district engineer for the WPA in this area. Earl Preston and Clarence A. Kale were respectively area engineer and construction superintendent in charge of the project for the WPA. H. W. McMillen, office engineer, was in charge of preparation of plans and Field Engineer Roy H. Shannon was in charge of inspection for Sedgwick County.

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Architect C. J. Ryland

Bank for Carmel by the Sea

By C. J. Ryland, Architect

CARMEL is an interesting California village with an ocean setting and a background of picturesque storybook buildings. Some are sufficiently quaint to be considered good from the viewpoint of the tourist, but few are of such stable substance as to be good from the practical standpoint. The community is largely composed of art-conscious people among whom are many fine artists. Naturally any artistic addition to the local scene, such as an architectural structure, commands a large audience and one brimming with divergent criticisms and suggestions.

It is not difficult to imagine, therefore, the problem confronting the directors of the Bank of Carmel when they determined to build a bank to be used over the next 50 years. With a far-sighted view, they required a building of sound construction and a design that would

wear well over the years. Their interpretation of these requirements was a modern structure. To me, as the architect, this meant concrete—and in order that the building might reflect the atmosphere of the village, a low, simple, friendly, as well as a "bankish" structure was designed.

Except for the truss roof, it is entirely concrete, 50x95 ft. in plan, 24 ft. high, and includes an over-all basement and 12-ft. mezzanine floor at each end.

The lobby, or public space, is separated from the work space by a natural-colored, walnut screen carried to the counter line. Above is glass, bleached wood and light bronze. Since this screen is very low and of light color, it is visually almost not there. In most banks there is a barrier at the entrance and counter screens between the customers and bank personnel. As designed, this barrier is eliminated in the Bank of Carmel by making the main entrance vestibule a continuation of the U-shaped bank counter, thus forming the lobby. This, paradoxically, brings the pedestrian within the bank while he is still on the sidewalk.

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The building was erected during a period of five months by Wm. P. Sweeney, contractor of Pacific Grove, Calif. Cost of the structure was approximately $40,000.

The U-shaped work space around the walls is well lighted by large glass block window areas.

Memorial Auditorium, Burlington, Iowa, has the unusual function of housing four different groups and is arranged for the use of all without interference and with a minimum amount of scheduling the use of common space. It was designed by Robin B. Carswell, architect, in collaboration with the Public Buildings Branch, Procurement Division, Treasury Department. Peter Kiewit Sons' Co. was contractor.

Memorial Auditorium for Burlington, Iowa

BY ROBIN B. CARSWELL, ARCHITECT

IN the spring of 1929 Burlington Post No. 52 of the American Legion attempted to arouse the interest of the citizens of Burlington, Iowa, in an auditorium to commemorate the soldiers and sailors who gave their lives in the last war, and to approve a bond issue to enable such a structure to be erected.

The bond issue failed by a narrow margin and, due to the depressed financial condition throughout the country immediately following, all thoughts of further action were abandoned for a time. In the summer of 1935 the Junior Chamber of Commerce took the initiative in reviving interest in this much needed auditorium, and suggested that it should be a structure combining also quarters for the Naval Reserve and the American Legion.

Realizing the inability to finance the project with local funds, an attempt was made to secure federal aid through the Public Works Administration. This failed, but desired help came in the form of a WPA project in November, 1935, and was immediately accepted by the city. Plans were prepared immediately for an architectural concrete building.

The choice of concrete construction not only created much work for local labor, but also proved a boom to native products used as building materials, and to local transporting agencies. Other factors influencing the architect's decision to use concrete were: the adaptability of the material to monumental treatment; its ability to assume simple lines

The stage loft is exterior evidence of the large stage, a feature of the main hall which is used for dramatic events, conventions, sports, dances and banquets.

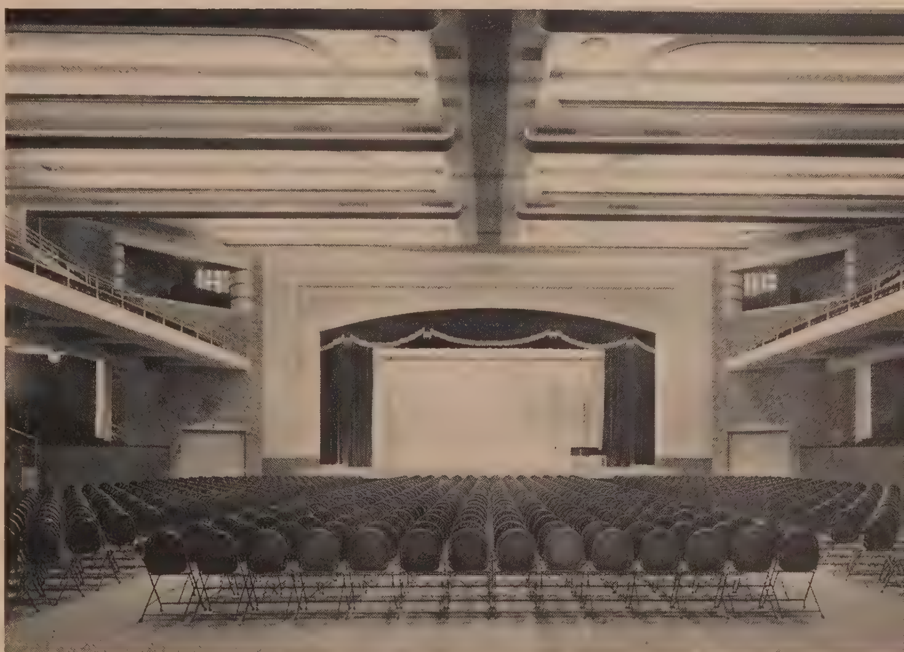
and bold masses; its low construction cost, and minimum maintenance expense.

Construction started in March 1939 and final completion was effected November 1, at a total cost of $527,084, including equipment, fees and other expenses.

The building has smooth-formed walls, relieved by balanced groups of tall, vertical openings, some of which are glazed with glass block. A distinctive feature of the structure is the stage loft which rises to a considerable height above the mass of the building. Decorative detail is confined to groups of grille openings on each side of the four corners of the building. Exterior finish is oil paint.

More than 17,000 lin.ft. of concrete piling support the structure. The floors, all of which are concrete of solid slab design, are

Proscenium arch is exposed concrete; the walls are furred with lightweight concrete masonry units.



supported on concrete columns and beams. While some 50,000 sq.ft. of concrete floors are exposed, of which 39,000 sq.ft. are stained maroon, other floor areas are topped with a variety of finish materials, including wood block, maple flooring, terrazzo and tile.

The auditorium proper is horseshoe shape with bleachers and a balcony surrounding three sides. Both the bleacher and balcony are of concrete construction. Seating capacity provides for 2,500 persons. The proscenium arch, having a span of approximately 60 ft., was cast in one continuous operation. When forms were stripped, texture and detail were found to be so well executed that practically no patching was necessary.

The inside face of the reinforced concrete walls, the interior walls and partitions are

Entrance to Naval Reserve unit quarters.

lightweight concrete masonry. In the auditorium the units are laid up in an attractive ashlar pattern. In this area the masonry, aside from decorative value, produces desired acoustical control and provides adequate insulation. The masonry in the auditorium is left in its natural color. Elsewhere exposed units are finished with portland cement paint in various colors.

The building is heated and ventilated by means of a split system with duct work so arranged that cooling can be added at some future date by the installation of mechanical refrigeration.

The functions imposed upon this structure are unique in that the building houses four distinct groups whose activities require the use of some of the same areas according to schedules convenient to each.

First, the auditorium, under management of the city of Burlington, is designed to accommodate all types of stage attractions, conventions, athletic events, dances, banquets and industrial exhibits. The stage accommodates a hundred-piece orchestra and is equipped for any kind of theatrical production. Banquet room and arena floor, combined, seat 1,200—the banquet room accommodating 400 and the arena 800. Thus two gatherings of separate organizations can convene at the same time or, by the aid of an efficient public address system, both areas can be used for one large meeting. When used as a convention hall, 12 committee rooms are available. Adjuncts of the auditorium portion of the building are a fully equipped modern kitchen, eight stage dressing rooms, and shower and locker room equipment.

Second functional unit of the building is the quarters of the Naval Reserve which has a complement of 77 men. Officers' quarters, classrooms, workshops, lounges and reading rooms occupy 24 rooms. In addition there is an 80-ft. rifle range and the auditorium floor is used for drill. The bridge and chart room at the rear of the auditorium and the gun rooms flanking the proscenium, designed to resemble stage boxes, are the dominant features of interest in the auditorium. Deck guns, with approximately 14-ft. barrels mounted in each box, can be trained in practically any direction.

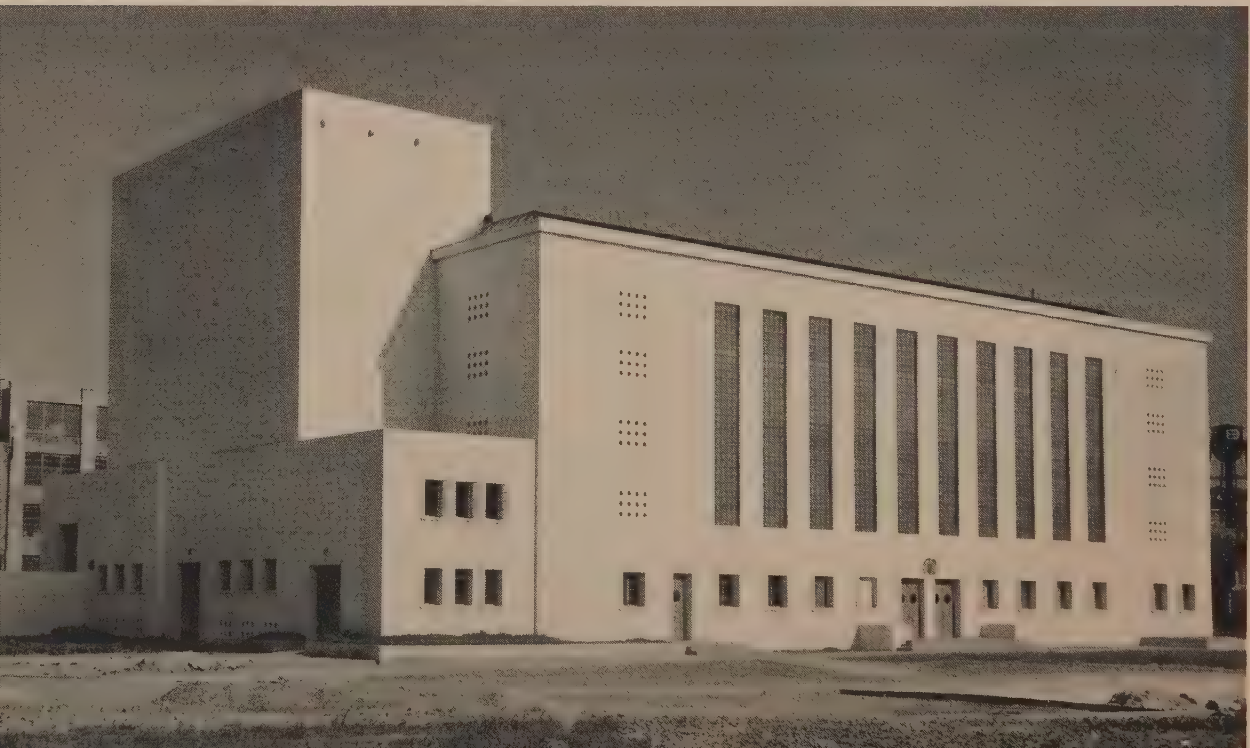
The third unit of the building is occupied by the Service No. 136 Medical Regiment, Iowa National Guard, and comprises seven rooms across the entire front of the fourth floor.

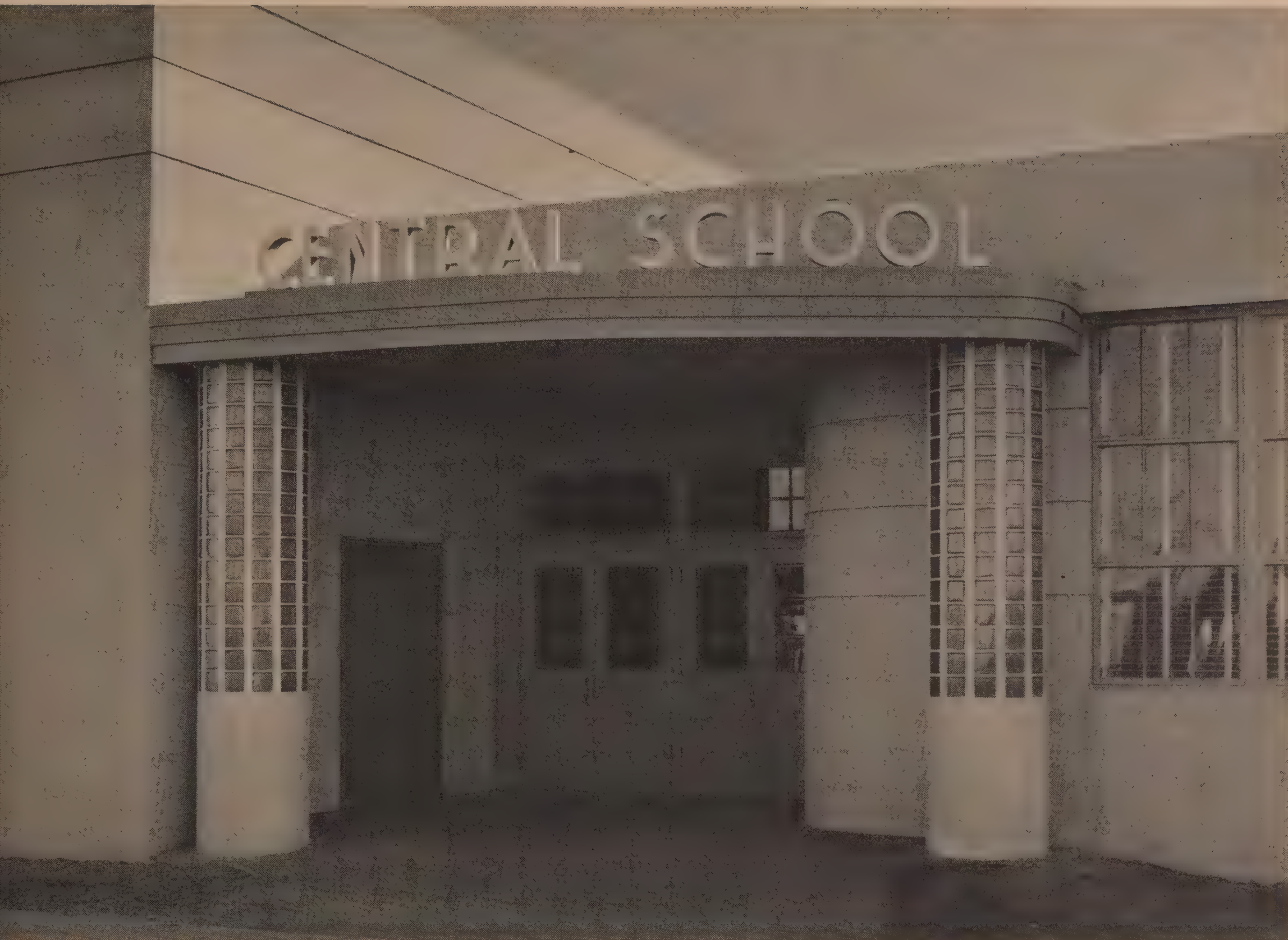
Fourth functional unit is occupied by the American Legion which occupies the east half of the ground floor as a permanent home. These quarters include a large lounge, recreation room, kitchenette and a small lounge for the Legion Auxiliary. The banquet room is available to the Legion for drills, regular meetings and for banquets.

The building, now in use for several months, is serving the community in a most satisfactory manner and the citizens are generous in their praise of the people who pressed the project to its completion. Large credit is due to James S. Cooper, Legion commander, and his loyal supporters who kept in close touch with the project from its inception.

The building was designed by the writer in collaboration with the Public Buildings Branch, Procurement Division, Treasury Department, who supervised construction. The building was constructed by Peter Kiewit Sons' Co., contractor of Omaha, Neb.

Smooth-formed walls of the auditorium are relieved by tall glass block panels which give height to the structure.





Entrance to Central School, San Diego, a one-story, firesafe, quake-resistant concrete building erected at a cost comparable to frame construction. This was no surprise to William P. Lodge, architect, who estimated the cost to the proverbial "T". F. E. Young built the foundation at a cost of $6,775, and Harry Muns was contractor for the superstructure at $66,825.

One-Story School in San Diego

Ordinary Cost But Extraordinary Value

By J. D. Conner*

FROM the point of view of a school official it was something of a revelation to find that a school plant of one-story elementary type could be built of reinforced concrete at a cost not materially different from the cost anticipated for ordinary frame and stucco construction.

Having failed by a narrow margin to secure a two-thirds vote of the San Diego Unified School District which would have authorized a bond issue making possible substantial allocations of Public Works Administration funds, it was necessary in the latter part of 1939 to abandon the thought of a comprehensive building program contemplating the expenditure of more than $1,750,000. A continuation of the present "pay as you go" policy was the necessary alternative, and the financing of construction was thereby limited to the sum which could be raised in District buildings funds

*Assistant Superintendent, San Diego Unified School District.

—not to exceed $300,000 annually—plus such federal assistance as could be obtained.

Central School was one project for which an individual PWA allocation had been approved. Preliminary plans accompanying the application contemplated frame and stucco construction at an estimated cost of $76,000. On the basis of careful estimates prepared by the architect, William P. Lodge, it appeared that the school could be designed and built of architectural concrete within the limit of budgeted funds. Therefore, the board of education authorized the preparation of working plans for a structure of concrete walls, floors and roof.

To expedite work, a foundation contract was let at once to F. E. Young at a cost of $6,775. On completion of working plans, a contract was let to Harry Muns, for building the superstructure at a figure of $66,825. The project, as built under these two separate contracts, thus cost the District $73,600. In order to make certain that budgeted funds would not be exceeded, certain details not essential to immediate needs were omitted from the plans. When these are added at a cost of $2,500, the total cost of the completed structure will be $76,100—a figure surprisingly close to the cost contemplated for frame-stucco construction first proposed.

It was in my province to work closely with the architect in the study of layout, arrangement and other details of the plans for this modern school plant. It is my conviction, based upon experience with this building and other modern units of our system, that low cost in high type construction can be obtained through proper approach to the problem of design.

Economy in reinforced concrete school buildings appears attainable through careful planning which considers the effect of cost of form and shape, of arrangement and assembly; which selects and employs those forms and arrangements entailing the least expenditure while desired standards of operating efficiency, low maintenance and pleasing appearance are preserved. While these factors in economical design were given full consideration in the planning of the Central School, it should be emphasized that no compromises were made in classroom size or in arrangement, nor were desired facilities reduced or omitted to make concrete construction possible. On the contrary, room sizes equal or exceed customary practice for this part of the country.

As an example, the kindergarten in this school is an unusually large and interesting functional unit comprising a main room with recessed play room, work room, lavatory and storage room. One of the classrooms in the building is over-size and equipped with a small stage for use in dramatic work. The facilities of the offices, teachers' rest room and storage spaces are exceptionally commodious; in fact, the teachers' room is more spacious than in any comparable school in the city.

In my opinion, the new Central School well illustrates the benefits which may accrue from the use of permanent materials under the influence of good planning.

Plan of Central School. Note ramps instead of stairs at entrances.

General view of Central School. Large window areas provide maximum daylight.

Design for Safety with Economy

By William P. Lodge, A.I.A.

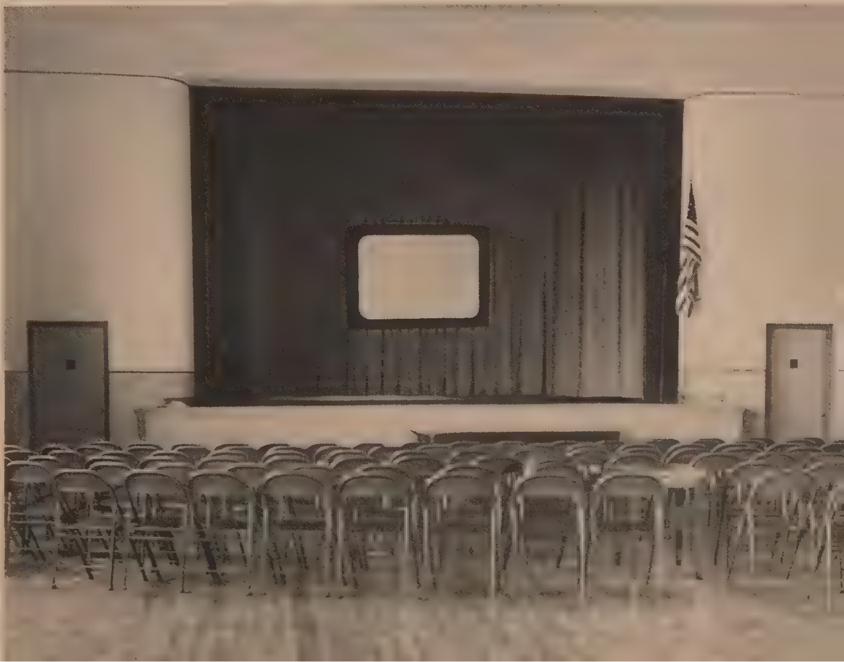
We have just concluded an enlightening experience with the completion of Central School, located on Central Ave. near University Ave., a business thoroughfare in San Diego. This area, built up rather closely with small homes and contiguous to a busy street, presents the usual hazards which make firesafe construction a most desirable quality in public school buildings.

However, the exigencies arising through the need of building additions and new units in various sections of the school district, together with the limited amount of funds available for building purposes, constituted ruling factors in the attitude of the board of education toward the choice of construction types. It was deemed impossible to pay a large premium for the construction of this new unit beyond the cost estimated for ordinary construction. Particularly in the case of one-story buildings, it was presumed that firesafe construction would be unduly expensive.

Although the preliminary plans were for frame and stucco, the Board, realizing the desirability of a more permanent construction, asked my opinion as to the cost of building the structure of architectural concrete. After making a detailed estimate I was able to inform them that I believed the building could be so constructed within the budget limit. This conclusion was predicated on a design procedure embodying all possible simplification of layout and arrangement that might influence cost.

It is most gratifying that the actual costs have borne out that estimate. Furthermore, the square foot cost of \$4.02 compares favorably not only with the cost usual in two-story structures of like materials, but with other one-story buildings of ordinary-type construction in this locality.

Although Mr. J. D. Conner, assistant superintendent of schools for the San Diego Unified School District, has stated in an accompanying article that economy was obtained without sacrificing anything in efficiency or quality, a brief review of the features of structure and installations will make it evident that this school is well built and equipped.



The small auditorium has a stage equipped for dramatic work.

Ceilings in classrooms slope down from window heads to diffuse light thoroughly over the room.

Exterior walls, seismic cross walls, columns and roof are all of reinforced concrete. Eighty per cent of the area has pan-joist type of roof; the remainder is solid slab and girder. Floors comprise a reinforced concrete slab on the ground, the classroom, corridor and administration room subfloors having a finish of asphalt tile, with maple flooring used in the auditorium. Ceilings in general are of suspended metal lath with acoustical plaster. In the auditorium, concrete walls and girders are exposed with acoustical ceiling finish.

Main toilets have terrazzo floors. Windows are of steel sash throughout and the front entrance has a modern touch effected by means of inner lighted glass brick columns. All mechanical installations are of first-class materials and newest design. Ramps lead to all entrances, eliminating all steps or stairs excepting those leading to the heater room.

My experience with the planning and construction of Central School, built for permanence and safety against all hazards, convinces me that the desire to spend carefully and wisely need not prevent the use of high type construction, but rather—as here demonstrated—constitutes a strong and larger argument for its wider use.

The San Diego Unified School District is governed by the board of education whose president is Mrs. Mildred Hale. Chief administrative officer is Will C. Crawford, superintendent of schools.

Bryan, Ohio, Builds Bathhouse

By Gale Dennis*

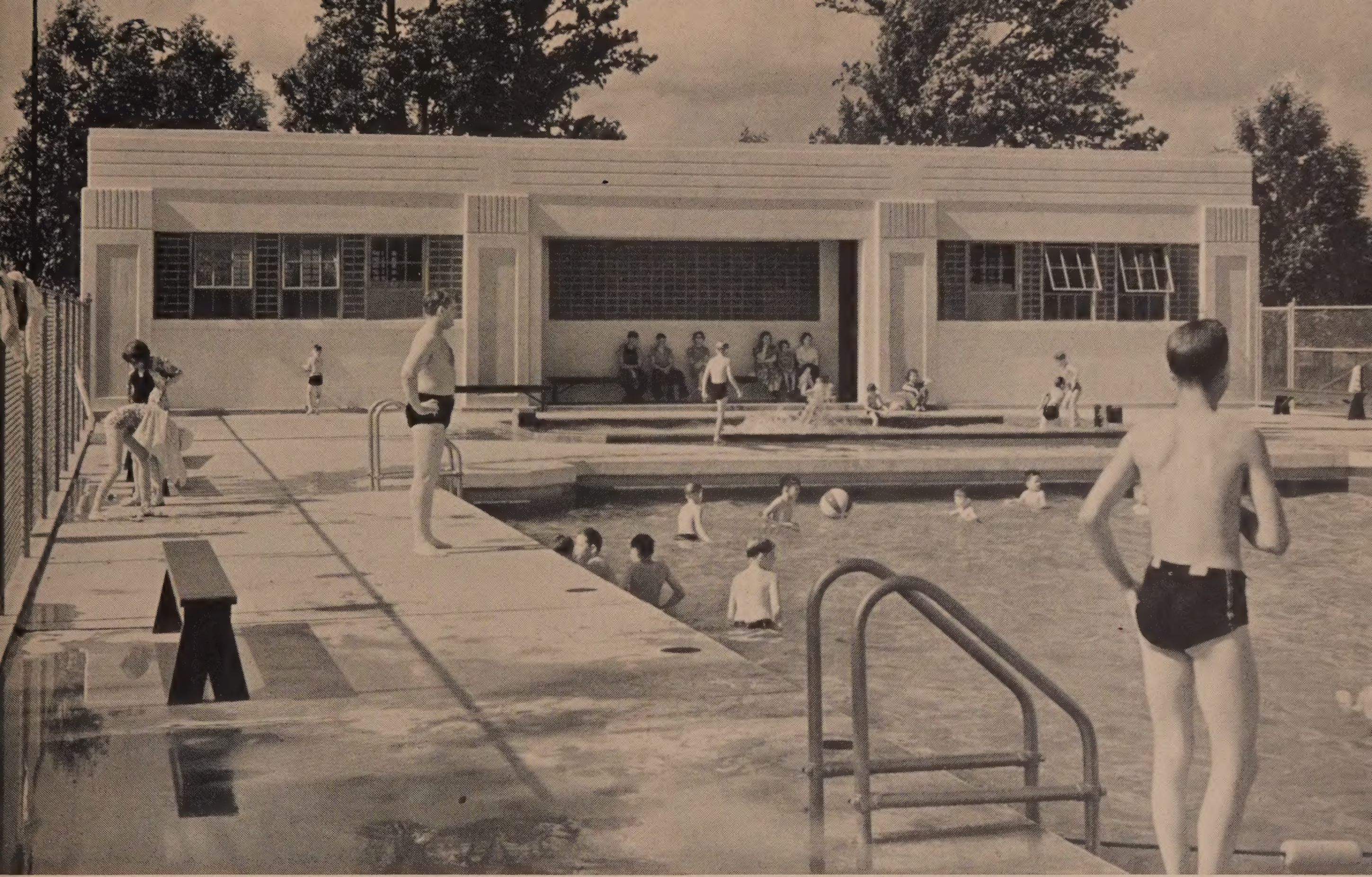
A NEW swimming pool and bathhouse, completed recently at Bryan, Ohio, were made possible through a bequest of $20,000 for the erection of a suitable memorial to the late William H. Moore, one-time prominent citizen of the town. This sum was augmented by making the work a WPA project, and the recreational plant as it stands represents an expenditure of $30,000.

The plan is simple and efficient. A large swimming pool, a small wading pool and the bathhouse are arranged in the order listed, within an enclosed area of 69x199 ft. The swimming pool, 45x110 ft., is surrounded on all four sides by concrete walkways. Between the big pool and the bathhouse is the wading pool, 15x28 ft. Both pools open onto the bathhouse which fronts the paved, enclosed area.

There was little unusual in the construction of the pools since more or less standard designs were followed. The walk-

*Project Supervisor, WPA.

Entrance to architectural concrete bathhouse at Bryan, Ohio.



Swimming pool, wading pool and bathhouse form a recreational unit in William H. Moore Memorial Park. Designed by Kermit E. Grose and O. H. Hines, the group was built by WPA for $30,000.

ways around the pools, however, presented a problem. To prevent them from settling into the 3-ft. dirt fill, the walks were placed in blocks approximately 12 ft. square. A reinforced concrete beam, 6x12 in., was formed around the edge of each block, and these beams were in turn supported on columns. The columns were made by boring through the fill to solid ground with a 12-in. post auger, and filling the holes with concrete.

The bathhouse is a low structure of modern design with large areas of glass block providing both maximum illumination and pleasing decorative effects. It is 32x69 ft. with shower and locker room facilities for men and women located in opposite ends of the building.

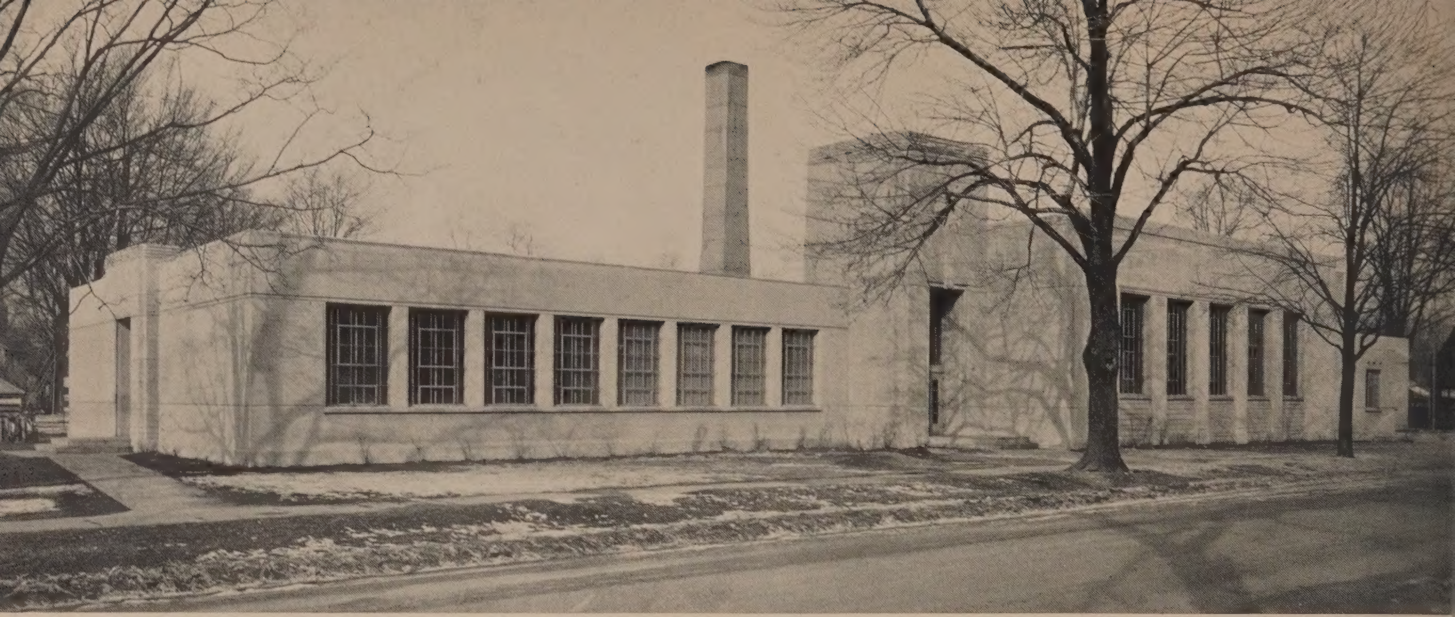
In choosing concrete for the bathhouse, Kermit E. Grose and O. H. Hines, co-designers of the project, sought a structure that would be economical in cost and maintenance, but pleasing in appearance. They recognized in concrete a material that would require little or no attention during the long season in which the pool facilities stand idle. The fact that both the concrete pool and the building itself could be painted in harmonious colors was considered, as was also the fact that an all-concrete plant could be easily kept in excellent sanitary condition.

The walls of the bathhouse were formed against plywood liners. Fluting on the columns was formed against 28-gage corrugated steel roofing. Narrow horizontal rustications in the coping were formed by inserting milled wood strips in the form faces.

After forms were stripped, all wall surfaces were rubbed twice with carborundum stones, then washed and brushed clean. Plain wall areas on the exterior were then painted with cream colored portland cement paint with deep buff paint applied to the columns for contrast. The walls of the concrete pools are painted green and the floors white. Painting in both cases has been most satisfactory in color and durability. The inside walls are all painted white.

Although the labor was entirely new to this type of work at the outset, the men soon were trained to do their different operations carefully. The illustrations indicate that they turned out a creditable job of concrete work.

Equipped with the most up-to-date filters and underwater pool lighting, which make the visibility in the pool even better at night than by day and attract many bathers to the pool in the evening hours, the plant has become one of the most popular summer recreation centers in the entire area.



A comprehensive survey of school property and pupil distribution was the basis for the location and plan of Second Ward School, Coldwater, Mich. Stone & Wagner, architects; construction was by WPA labor.

Coldwater, Mich., School Survey Determines Design

By Randall Wagner*

A SHORT time ago our architectural firm was commissioned by the board of education of Coldwater, Mich., to conduct a survey of the city's entire school system. This survey included the measuring of all present buildings and properties owned by the board of education and an analysis of maps and charts showing pupil population both by wards and grades. With this information the survey was extended to include the development of a tentative plan for new buildings to replace all the existing buildings and to care for future expansion in a program covering a 15 to 20-year building program. This plan development included drawings at ⅛-in. scale, an outline specification, and a cubic foot cost analysis.

When the Board early last year determined that funds were available for a new building, careful study of the survey revealed that a structure was most needed in the Second Ward. The building should be an elementary school since junior high school students attend one school in the central part of the city.

*Stone & Wagner, architects.

The appearance of the walls after they were cleaned was so pleasing th[at] no further treatment was used.

With this determined, new studies were made of both one-story and two-story buildings at very small scale, and sketches were prepared in colors of alternate exterior finishes in architectural concrete, brick and stone. The Board decided that a one-story building would be most practical for an elementary school, and the members were very enthusiastic about architectural concrete for its construction.

The building, known as the Second Ward School, comprises eight standard size classrooms, a kindergarten, offices, clinic, workshop and a community room fully equipped with stage, shower, locker, storage room and kitchenette. The exterior and proscenium walls of the community room are of architectural concrete with natural finish.

While plans were being prepared there was some discussion as to the probable effect of climatic conditions on condensation and expansion problems. The architects consulted

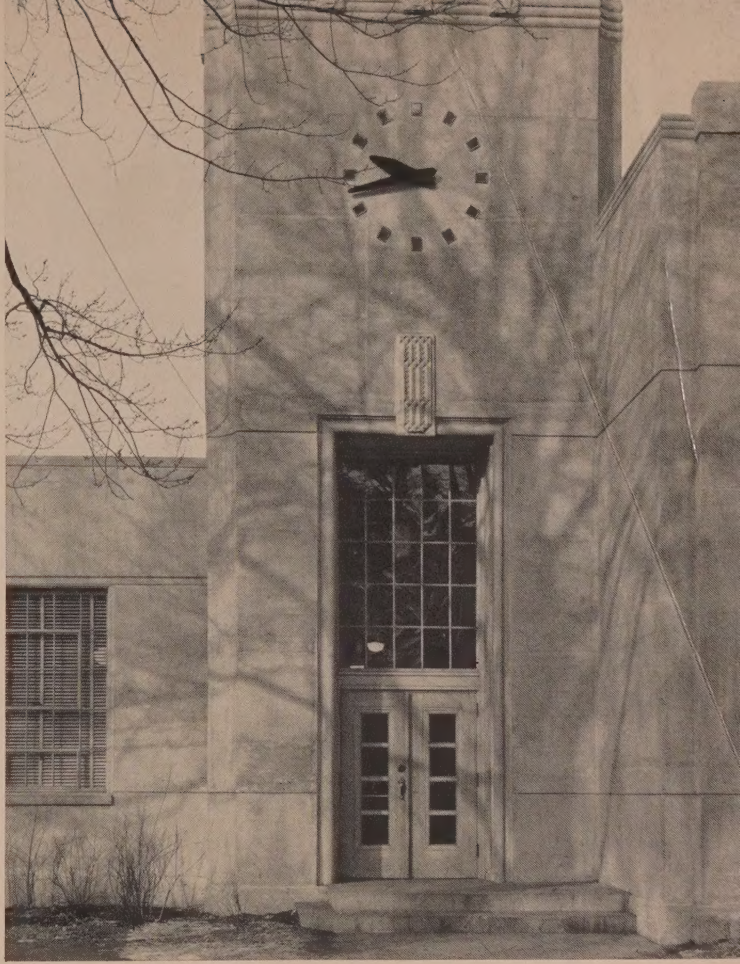
freely with experienced users of concrete, and solved these problems in the following manner:

Expansion was taken care of by use of two expansion joints with copper weather stops which practically divide the structure into three separate units. The condensation problem was met by furring the inside of all exterior walls with metal lath and plaster. Having taken these precautions no difficulty has been encountered due to climatic conditions.

In our future work of this kind we feel that control joints should be provided at appropriate intervals to absorb fine cracks that might otherwise normally appear in broad wall areas. These joints should be concealed by some form of V-joint or other architectural treatment consistent with the design. Care taken to determine the best location of horizontal and vertical construction joints greatly improves the appearance and scale of the building.

When plans for the building were completed our firm prepared an application for a WPA project which was approved. This method of construction, we found, calls for a somewhat different procedure than is customary where work is let to a contractor. It was necessary to employ certain skilled carpenters as form supervisors. A wise move was the employment of a skilled construction superintendent, Lester Hite, who is regularly in the service of the Miller-Davis Construction Co. of Kalamazoo. This supervision contributed materially to the success of the project since it insured properly constructed and braced forms and carefully placed concrete.

Great care was taken to be sure that the materials for the concrete were the best obtainable. Coarse aggregate consisted of crushed granite field stone which was found to contain some chert and soft materials. The aggregate, as delivered to the job, contained less than 2 per cent of these materials but after a visual inspection of the stone we decided there was still too much present. Accordingly, all the aggregate was picked over by hand and surprisingly large amounts of undesirable stone were removed. We found also that this crushed rock was deficient in the smaller sizes and the sand also lacked fines, so it was necessary to have special screened fine sand prepared and added at the mixer to give a proper balance to the mix. Once the mix was established, however, the work of placing concrete went smoothly and with excellent results.

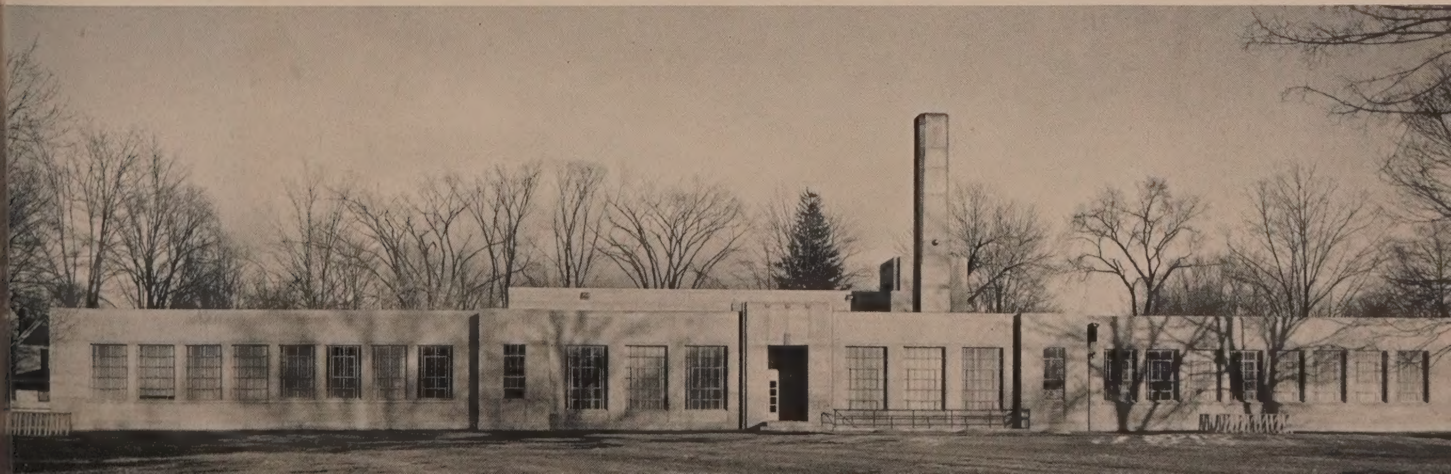


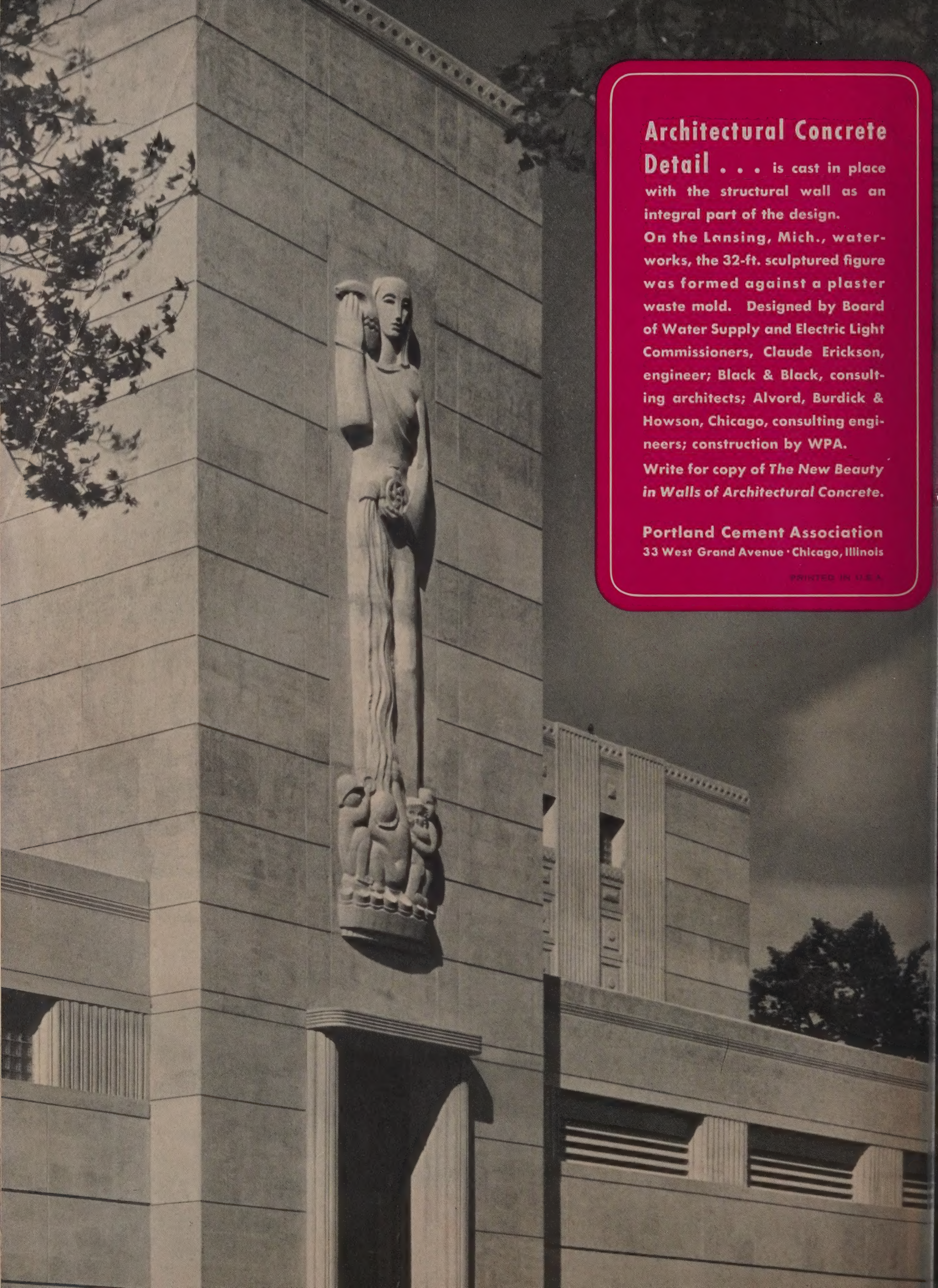
Over the entrance is a clock tower which terminates with a coping of molded detail.

It was the original intention to finish the walls of the building with portland cement paint, but everyone was so well pleased with the appearance as it stood at completion of forming and cleaning that it has been left unpainted.

Now the architects, board of education and the people of Coldwater are so satisfied with the results of this type of construction they feel that when additional units of their school building program are erected they should also be built of architectural concrete.

From the playground, the school presents a long horizontal wall pierced by many large windows.




Architectural Concrete Detail . . . is cast in place with the structural wall as an integral part of the design.
On the Lansing, Mich., waterworks, the 32-ft. sculptured figure was formed against a plaster waste mold. Designed by Board of Water Supply and Electric Light Commissioners, Claude Erickson, engineer; Black & Black, consulting architects; Alvord, Burdick & Howson, Chicago, consulting engineers; construction by WPA.
Write for copy of *The New Beauty in Walls of Architectural Concrete.*
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